

Understanding and modelling the challenges of information technology in urban and regional development

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ABSTRACT

In the last decade advances in information technology and the fast-growing stock of digital information became an important resource and driving force for successful development in urban regions in numerous locations all over the world. The instant and global availability of information and knowledge over the Internet enables not only the development of information-based economies; it also contributes to manifold social, cultural and environmental opportunities to improve current conditions. The pace of technological change in the IT-sector and the complexity of modern societies bear both opportunities and risks on the path of transformation of regional economies and the social and environmental quality of life. Nevertheless, it is not well understood how the combination of information, information technology, and know-how can actively be used to support the successful revitalisation of declining urban regions. Planning and decision-making in this domain are confronted with complexity and uncertainty because many aspects of human systems are involved, e.g. from the economic, social and ecological spheres, which are interacting simultaneously. Therefore integrated approaches are needed to build up an interdisciplinary understanding of the complex relationships and the dynamics that is driving urban regional development in current times. System thinking and systems modelling provide means to analyse the key relationships between structure and long-term behaviour in regional development in an integrative way. It uses tools to represent the cause-effect structures and the underlying feedback loops, which govern growth and decline processes. System simulation models allow calculating the consequences of specific feedback structures and experiencing the possible long-term behaviour of regional systems considering aspects like economic development, jobs, regional population, land use patterns and regional quality of life. Additionally, computer models support the search for policy options and testing their feasibility under alternative conditions. This approach can be used as a consulting tool for managers and public authorities in planning possible sustainable futures of urban regions with regard of the emerging information und communication technology.